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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/777,012
Filing Date: February 06, 2001
Appellant(s): LE ROY ET AL.

John A. Sopp
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 20, 2004.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 21 – 32 and 35 – 49 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

2,288,177	Beuzelin et al.	10-1995
5,705,565	Hughes et al.	1-1998
5,516,583	Zhang	5-1996
5,998,545	Melot	12-1999
6,033,749	Hata et al.	3-2000

(10) Grounds of Rejection

Allowable Subject Matter

Claims 23 and 38 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art of record discloses a laminate comprising a layer of high density polyethylene and a binder layer having a defined melt flow rate, but fails to disclose a binder comprising a mixture of 5 to 30 parts by weight of a mixture of a polyethylene and a polymer selected from the group consisting of elastomers, very low density polyethylenes and metallocene polyethylenes and 95 to 70 parts by weight per hundred of a polyethylene with a density of from 0.910 to 0.930 g/cm^3, the mixture being such that its density is from 0.910 to 0.930 g/cm^3 and its melt flow index at 190 degrees Celsius and 2.16 kg, is between 0.1 and 3 g/10 min.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 21 – 22, 24 – 28, 31 – 32 and 39 – 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beuzelin et al (U.K. Patent No. 2288177) in view of Hughes et al (U.S. Patent No. 5,705,565).

With regard to Claim 21, Beuzelin et al disclose a structure comprising, successively, a first layer of high density polyethylene, a layer of binder, and a second layer of ethylene vinyl alcohol (page 13, line 11 and lines 16 – 23); the binder is a polyolefin comprising high density polyethylene and low density polyethylene (page 9, lines 7 – 19) grafted with an unsaturated carboxylic acid (page 5, lines 1 – 29; page 6, lines 1 – 4), and the structure comprises a third layer of binder (page 13, line 11); the structure therefore comprises a third layer of a mixture of

high density polyethylene and low density polyethylene. Beuzelin et al fail to disclose a third layer which is a mixture of a polyolefin and a polyamide.

Hughes et al teach that a composition comprising high density polyethylene and a low density polyethylene (column 5, lines 8 – 9) is used interchangeably (column 5, line 7) with a composition comprising high density polyethylene and low density polyethylene and polyamide (column 5, line 22) as a binder layer (tie layer; column 6, lines 6 – 10) between high density polyethylene and ethylene vinyl alcohol (column 6, lines 6 – 10) for the purpose of obtaining a binder having desirable adhesive properties (column 6, lines 6 – 10). Therefore, one of ordinary skill in the art would have recognized the advantage of providing for the mixture of polyolefin and a polyamide in Beuzelin et al, which is a binder layer, depending on the desired adhesive properties of the end product as taught by Hughes et al.

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for a mixture of polyolefin and a polyamide in Beuzelin et al in order to obtain a binder having desirable adhesive properties as taught by Hughes et al.

With regard to Claim 22, Beuzelin et al fail to disclose two layers of binder between the ethylene – vinyl alcohol layer and polystyrene layer. However, Beuzelin et al disclose one layer of binder between the ethylene – vinyl alcohol layer and polystyrene layer, as discussed above. It would have been obvious to one having ordinary skill in the art at the time Applicant's invention was made to have provided for additional layers, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art.

With regard to Claims 26 and 39, Beuzelin et al disclose a third layer which comprises a mixture of polyethylene and very low density polyethylene having a density of between 0.880 and 0.970 (page 9, lines 7 – 19) and a melt flow index of 7 g/10 min (page 22, lines 5 – 8); Beuzelin et al fail to disclose a polymer which comprises a third layer which comprises 70 – 95% of a mixture of polyethylene and very low density polyethylene and 5 – 30 parts by weight per hundred of a polyethylene with a density 0.930 to 0.950 g/cm^3.

However, Beuzelin et al disclose a layer which comprises a mixture of polyethylene and very low density polyethylenes having a density of between 0.880 and 0.970 (the layer comprises a mixture of polyethylene and very low density polyethylenes having a density of between 0.880 and 0.970; page 9, lines 1 – 19) and a content of grafted unsaturated carboxylic acid of 0.005 to 5% by weight (page 5, lines 17 – 24) and teach that the compositions are employed for their resistance to separation of layers (page 15, lines 17 – 21). Therefore, one of ordinary skill in the art would have recognized the utility of varying the amounts of the polyethylenes in the mixture and their densities and the amount of grafted carboxylic acid to obtain a desired resistance to separation of layers. Therefore, the resistance to separation of the layers would be readily determined through routine optimization of the amounts of the polyethylenes in the mixture and their densities and the amount of grafted carboxylic acid by one having ordinary skill in the art depending on the desired end use of the product.

It therefore would be obvious for one of ordinary skill in the art to vary the amounts of the polyethylenes in the mixture and their densities and the amount of grafted carboxylic acid in order to obtain a desired resistance to separation of the layers, since the desired resistance to

separation would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end result as shown by Beuzelin et al.

With regard to Claim 24, the density of the binder disclosed by Beuzelin et al is between 0.880 and 0.970 g/cm^3 (page 9, lines 7 – 19).

With regard to Claim 25, the polyethylene disclosed by Beuzelin et al is linear low density polyethylene (page 9, lines 7 – 19).

With regard to Claim 27, the binder disclosed by Beuzelin et al is a polyethylene grafted with maleic anhydride (page 5, lines 6 – 11), and a melt flow index of 7 g/10 min (page 22, lines 5 – 8) and a density between 0.920 and 0.930 g/cc (page 22, lines 5 – 8).

With regard to Claim 28, the grafted polyethylene is mixed with ethylene – vinyl acetate copolymer (page 11, lines 11 – 14); both the grafted polyethylene and ethylene – vinyl acetate have densities between 0.880 and 0.970. Beuzelin et al do not teach that the ethylene vinyl acetate is grafted; the claimed aspect of the grafted polyethylene being 'diluted with an ungrafted polyethylene' therefore reads on Beuzelin et al. Beuzelin et al fail to disclose from 70 to 98 % by weight non – grafted polyethylene.

However, Beuzelin et al disclose a layer which comprises non – grafted polyethylene by weight (the mixture comprises non – grafted polyethylene; page 11, lines 11 – 14 and teach that the compositions are employed for their resistance to separation of layers (page 15, lines 17 – 21). Therefore one of ordinary skill in the art would have recognized the utility of varying the amounts of non – grafted polyethylene to obtain a desired resistance to separation of layers. Therefore, the resistance to separation of the layers would be readily determined through routine

optimization of the amounts of non – grafted polyethylene in the mixture by one having ordinary skill in the art depending on the desired end use of the product.

It therefore would be obvious for one of ordinary skill in the art to vary the amount of non – grafted polyethylene in the mixture in order to obtain a desired resistance to separation of the layers, since the desired resistance to separation would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end result as shown by Beuzelin et al.

With regard to Claims 31 – 32, the third layer disclosed by Beuzelin et al comprises a high density polyethylene and very low density polyethylene (page 9, lines 7 – 19) cografted with an unsaturated carboxylic acid (fumaric acid; page 5, lines 12 – 29).

With regard to Claims 40 – 42, Beuzelin et al discloses a food container which contains a fluid consisting of the structure (the container is a food container, therefore containing air, which is a fluid; page 15, lines 16 – 23); the third layer is therefore in direct contact with the fluid which is contained.

With regard to Claims 43 – 44, Hughes et al fail to teach a structure in which the third layer comprises 60% to 70% by weight of the polyamide, 5 – 10% by weight of the grafted polymer and the remainder high density polyethylene. However, Hughes et al teach a structure in which the third layer comprises polyamide and grafted polymer, as discussed above, and Beuzelin et al teach that the compositions are employed for their resistance to separation of layers (page 15, lines 17 – 21). Therefore one of ordinary skill in the art would have recognized the utility of varying the amounts of polyamide and grafted polymer to obtain a desired resistance to separation of layers. Therefore, the resistance to separation of the layers would be

readily determined through routine optimization of the amounts of polyamide and grafted polymer in the mixture by one having ordinary skill in the art depending on the desired end use of the product.

It therefore would be obvious for one of ordinary skill in the art to vary the amount of polyamide and grafted polymer in the mixture in order to obtain a desired resistance to separation of the layers, since the desired resistance to separation would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end result as shown by Beuzelin et al and Hughes et al.

With regard to Claim 45, Hughes et al teach the use of a polyamide comprising polyamide 6,6 (column 15, lines 1 – 20) the claimed aspect of the polyamide comprising a polyamide 6/6,6 copolymer which is a copolymer of caprolactam, adipic acid and hexamethylenediamine therefore reads on Hughes et al.

With regard to Claim 46, Beuzelin et al fail to disclose a structure having a first layer thickness of between 2 and 10 mm and a second layer thickness between 30 and 500 μm. However, Beuzelin et al disclose a structure having a layer thickness of 100 to 1000 μm and a total thickness of 100 μm to 3 mm (page 14, lines 24 – 29; page 15, lines 1 – 12).

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beuzelin et al (U.K. Patent No. 2288177) in view of Hughes et al (U.S. Patent No. 5,705,565) and further in view of Zhang et al (U.S. Patent No. 5,516,583).

Beuzelin et al and Hughes et al disclose a laminate structure comprising a layer of binder as discussed above. The binder consists of very low density polyethylene (page 9, lines 7 – 19 of Beuzelin et al), 5 – 35% by weight grafted polyethylene and 5 – 45% by weight polystyrene

elastomer (page 3, lines 18 – 24; page 10, lines 24 – 29; page 11, lines 1 – 14 of Beuzelin et al). Beuzelin et al fail to disclose a polyethylene which is a metallocene polyethylene.

Zhang et al teach the use of metallocene polyethylene in the making of an adhesive (column 4, lines 17 – 30 of Zhang) for the purpose of making an adhesive having excellent extrudability (column 2, lines 24 – 32 of Zhang). Therefore, one of ordinary skill in the art would have recognized the advantage of providing for the metallocene polyethylene of Zhang et al in Beuzelin et al and Hughes et al, which comprises an adhesive, depending on the desired extrudability of the end product as taught by Zhang et al

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for metallocene polyethylene in Beuzelin et al and Hughes et al in order to make an adhesive having excellent extrudability as taught by Zhang et al.

Claims 30 and 35 – 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beuzelin et al (U.K. Patent No. 2288177) in view of Hughes et al (U.S. Patent No. 5,705,565) and further in view of Melot et al (U.S. Patent No. 5,998,545).

Beuzelin et al and Hughes et al disclose a laminate structure comprising a layer of binder comprising polyamide as discussed above. With regard to Claims 30 and 35, Beuzelin et al fail to disclose a polyamide which comprises a copolymer comprising polyamide 6 and polytetramethylene glycol blocks.

Melot teaches the grafting of styrene – polyolefin blends with copolymers having polyamide 6 blocks and polytetramethylene glycol blocks (column 4, lines 15 – 19 of Melot) for

the purpose of making films having good stability after extrusion (column 4, lines 59 – 67 of Melot). Therefore, one of ordinary skill in the art would have recognized the advantage of providing for the grafting with polyamide 6 and polytetramethylene glycol blocks of Melot in Beuzelin et al and Hughes et al, which comprises a styrene – polyolefin blend, depending on the desired stability after extrusion of the end product.

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for a copolymer having polyamide 6 blocks and polytetramethylene glycol blocks in Beuzelin et al and Hughes et al in order to make films having good stability after extrusion as taught by Melot.

With regard to Claim 36, the binder disclosed by Beuzelin et al and Hughes et al comprises a mixture of polyethylene and very low density polyethylene and an ethylene – alkyl methacrylate – maleic anhydride copolymer (page 5, lines 6 – 27 of Beuzelin et al).

With regard to Claim 37, the binder disclosed by Beuzelin et al and Hughes et al comprises two functionalized polyolefins comprising at least 40% ethylene (low density polyethylene and linear low density polyethylene; page 9, lines 7 – 19 of Beuzelin et al); the binder therefore comprises more than 50% ethylene; the binder also comprises isoprene rubber (page 8, lines 10 – 14) and is therefore crosslinkable.

Claims 47 – 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beuzelin et al (U.K. Patent No. 2288177) in view of Hughes et al (U.S. Patent No. 5,705,565) and further in view of Hata et al (U.S. Patent No. 6,033,749).

Beuzelin et al and Hughes et al disclose a container comprising a laminate comprising high density polyethylene and ethylene vinyl alcohol copolymer as discussed above. With regard to Claims 47 – 49, Beuzelin et al and Hughes et al fail to disclose a container which is a petrol container.

Hata et al teach a petrol container (fuel container; column 1, lines 8 – 11) comprising a laminate comprising high density polyethylene and ethylene vinyl alcohol copolymer (column 5, lines 50 – 52) for the purpose of obtaining a petrol container which provides good impermeability to oxygen – containing petrol (column 1, lines 8 – 11). Therefore, one of ordinary skill in the art would have recognized the utility of providing for the fuel tank of Hata et al as the container of Beuzelin et al and Hughes et al, depending on the impermeability to oxygen – containing petrol of the end product as taught by Hata et al.

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for the fuel tank of Hata et al as the container of Beuzelin et al and Hughes et al in order to obtaining a petrol container which provides good impermeability to oxygen – containing petrol as taught by Hata et al.

(11) Response to Argument

Claims 23 and 38 are indicated as allowable subject matter above. The 35 U.S.C. 103(a) rejections of Claims 23 and 38 as being unpatentable over Beuzelin et al (U.K. Patent No. 2288177) in view of Hughes et al (U.S. Patent No. 5,705,565), of record in the previous Action, have been withdrawn. Please note the reasons for allowance in section 10 of the Examiner's Answer.

Appellant argues that the binder layer of Beuzelin cannot satisfy the 'third layer' recitation of the instant claims, because one of ordinary skill in the art would know that a binder layer is distinct from a structural layer and it is clear from the claims that appellants' third layer is a structural layer, not a binder layer; a binder layer differs from a structural layer in its form, Appellant argues, being much thinner, and its function is to attach two adjoining layers.

However, Applicant does not claim that the third layer is a structural layer, rather than a binder layer, and therefore does not exclude a binder layer as disclosed by Beuzelin et al. Furthermore, no thickness is claimed, and because of the use of the term 'comprising,' the claimed invention does not exclude a 'third layer' which attaches two adjoining layers.

Appellant also argues that Beuzelin et al distinguishes binder layers from other layers.

However, as stated above, Applicant does not claim that the third layer is a structural layer, rather than a binder layer, and therefore does not exclude a binder layer as disclosed by Beuzelin et al. Furthermore, because of the use of the term 'comprising,' the phrase 'third layer' does not exclude a layer which attaches two adjoining layers.

Appellant also argues that in the Beuzelin et al embodiment PS/binder/EVOH/binder/PO, where PO is the first layer and EVOH is the second layer, the PS layer would be the third layer, not the binder layer.

However, the phrase 'third layer' is sufficiently broad to define either a binder layer or non – binder layer, therefore the claimed 'third layer,' which is adjacent to an ethylene vinyl alcohol layer, does not exclude the binder layer disclosed by Beuzelin et al.

Appellant also argues that the instant disclosure discusses binder layers as separate from the first, second and third layers.

However, as stated above, the claims do not define the 'third layer' as a non – binder layer, or having a composition different from that of a layer of binder, because the layer is defined only as a 'third layer,' which does not exclude a layer of binder as taught by Beuzelin et al.

Applicant also argues that the claims make clear to one of ordinary skill in the art that the first, second and third layers of the instant claims are not binder layers.

However, as stated above, the third layer is not defined is a non – binder layer, and therefore does not exclude the binder layer disclosed by Beuzelin et al.

Appellant also argues that the only use for which Hughes suggests adding other polymers to its ethylene graft polymer is in making molded or extruded shaped articles; when Hughes

discusses the separate use of the graft polymer as an adhesive layer or binder, Appellant argues, there is no disclosure to include a polyamide in the adhesive binder layer.

However, Hughes et al teach the blending of its polymer with other polymer for the production of extruded shaped articles (column 4, lines 62 – 65) and teaches the use of an extruded layer of the polymer for use as an adhesive film, which is clearly an extruded article (column 6, lines 9 – 12). The fact that Hughes et al does not teach the addition of other polymers when discussing the adhesive does not exclude the addition of other polymers, and a discussion of the other polymers is in fact unnecessary, as Hughes et al have already taught the blending of the polymers with other polymers in the making of an extruded article and the adhesive film is extruded.

Appellant also argues that the Hughes et al teachings regarding providing an adhesive layer do not relate to adhesive layers containing a polystyrene component, and one of ordinary skill in the art would not consider such teachings for modifying a binder such as Beuzelin et al, which is principally based on a polystyrene component.

However, the binder disclosed by Beuzelin et al comprises a blend of polystyrene and ethylene copolymer comprising 5% polystyrene by weight and 95% ethylene copolymer by weight (page 10, lines 23 – 28), and it is therefore not clear what is meant by the phrase 'principally based' on a polystyrene component.

Appellant also argues that Hughes et al suggests combining a polyamide with its grafted polyethylene when preparing shaped articles to improve their impact properties; Hughes does not provide suggest providing a binder or adhesive comprising polyamide, Appellant argues, and in

fact uses only the grafted polyethylene when binder properties are required, thus suggesting that other components would be detrimental to the adhesive effect.

However, as stated above, Hughes et al teach the blending of its polymer with other polymer for the production of extruded shaped articles (column 4, lines 62 – 65) and teaches the use of an extruded layer of the polymer for use as an adhesive film, which is clearly an extruded article (column 6, lines 9 – 12). The fact that Hughes et al does not teach the addition of other polymers when discussing the adhesive does not exclude the addition of other polymers, and a discussion of the other polymers is in fact unnecessary, as Hughes et al have already taught the blending of the polymers with other polymers in the making of an extruded article and the adhesive film is extruded. Furthermore, Hughes does not teach that other components would be detrimental to the adhesive effect.

Appellant also argues that even if the Beuzelin et al binder modified by Hughes et al generically encompasses the possibility of a mixture of the claimed components, it also encompasses hundreds of other possibilities which are not such a mixture; the definition of the binder at pages 3 – 5 of Beuzelin et al, Applicant argues, contains many alternative permutations.

However, although pages 3 – 5 of Beuzelin et al disclose equivalent embodiments for the composition of the binder, Beuzelin et al, as stated above, disclose the claimed invention except for the polyamide of the third layer, and the use of polyamide in the third layer would have been obvious to one of ordinary skill in the art in view of Hughes et al.

Appellant also argues that Beuzelin et al and Hughes et al cannot fairly suggest picking out a combination of a 'C2' grafted polymer as claimed and a 'C2' non – grafted polymer as claimed, from Beuzelin et al.

However, a 'C2' grafted polymer and a 'C2' non – grafted polymer are not disclosed by Beuzelin et al; the binder disclosed by Beuzelin et al comprises a monomer cografted onto a mixture of ethylene – α olefin copolymers (page 4, lines 1 – 9), and the ethylene – α olefin copolymers comprise high density polyethylene and low density polyethylene (page 9, lines 6 – 19).

Appellant also argues that Beuzelin et al do not even generically encompass or suggest any embodiment which includes a co – graft of polyethylene and a 'C2' polymer; the only co – grafts generically included in the Beuzelin et al binder, Appellant argues, are between polyethylene and polystyrene.

However, Beuzelin et al disclose a co – grafting of polystyrene and at least one ethylene – α olefin copolymer (page 4, lines 1 – 9) and discloses a group of ethylene – α olefin copolymers from which the ethylene – α olefin copolymers are selected, including high density polyethylene, low density polyethylene and very low density polyethylene (page 9, lines 1 – 14); Beuzelin et al therefore disclose the co – grafting of high density polyethylene, low density polyethylene and very low density polyethylene and polystyrene with each other, and therefore discloses the co – grafting of high density polyethylene, which is a polyethylene as claimed, with an ethylene copolymer, therefore a 'C2' polymer.

Appellant also argues that there is no suggestion in Beuzelin et al to co – graft two polymers from its list of '(c)' polymers on page 9.

However, as stated above, Beuzelin et al clearly disclose on page 4, lines 1 – 9, the co – grafting of a monomer onto a mixture of polystyrene and at least one ethylene – α olefin copolymer, thus the mixture comprises one, or more than one, ethylene – α olefin copolymer;

furthermore, the ethylene – α olefin copolymers to be included in the mixture are in the list of '(c)' polymers on page 9 (page 9, lines 1 – 14).

Appellant also argues that in addition to all the possible permutations of Beuzelin's binder, one of ordinary skill in the art would not necessarily select pick a polyamide from the large number of polymers taught by Hughes et al in column 5 of Hughes et al .

However, although Hughes et al teaches polyamide and other polymers that are equivalent to polyamide (column 5, lines 8 – 20) for addition to an ethylene copolymer, Beuzelin et al, as stated above, disclose the claimed invention except for the polyamide of the third layer, and the use of polyamide of the third layer would have been obvious to one of ordinary skill in the art in view of Hughes et al.

Appellant also argues that Beuzelin et al provide no suggestion of an embodiment which contains an additional binder layer between the second and third layer, as recited in the claims at issue.

However, even if additional binder layers, and the additional 'structural' layers such as polyolefin and ethylene vinyl alcohol which are adhered to each other by the additional binder layers, are included between the second and third layer of the claimed invention, the claimed invention is unpatentable over Beuzelin et al, because Beuzelin et al do not limit the disclosed laminate to the three and five – layer embodiments of page 13. Furthermore, it is unclear why the mere addition of further layers would patentably distinguish the claimed invention over Beuzelin et al, in the absence of unexpected results.

Appellant also argues that Beuzelin et al does not disclose a structure having a binder of polyethylene grafted with maleic anhydride.

However, as discussed above, the binder disclosed by Beuzelin et al comprises ethylene – α olefin copolymers, therefore polyethylenes, which are co – grafted with polystyrene; the polyethylenes are therefore grafted. The polyethylenes are grafted with a monomer comprising an acid anhydride (page 3, lines 13 – 17) comprising maleic anhydride (page 5, lines 24 – 25).

Appellant also argues that Hughes et al does not describe its adhesive films as being useful for binding a polystyrene – containing layer, thus there would be no motivation to use the films taught by Hughes et al as a binder in Beuzelin et al.

However, the adhesive films taught by Hughes et al are taught for the purpose of binding ethylene – vinyl alcohol layers to other layers (column 6, lines 6 – 9), and the binding layer of Beuzelin et al is also used to bind an ethylene – vinyl alcohol layer to another layer (page 13, lines 10 – 11), thus there would be motivation to use the films taught by Hughes et al as a binder in Beuzelin et al.

Appellant also argues that there is no suggestion from Beuzelin et al to co – graft two '(c)' polymers from the list on page 9; the only co – grafts which are disclosed, Appellant argues, are co – grafts of a styrene polymer with an ethylene polymer.

However, as stated above, Beuzelin et al clearly disclose on page 4, lines 1 – 9, the co – grafting of a monomer onto a mixture of polystyrene and at least one ethylene – α olefin copolymer, thus the mixture comprises one, or more than one, ethylene – α olefin copolymer; furthermore, the ethylene – α olefin copolymers to be included in the mixture are in the list of '(c)' polymers on page 9 (page 9, lines 1 – 14).

Appellant also argues that the requirements of Claim 43, which recites particular amounts of the third layer components, is even more remote from Beuzelin et al and Hughes et al than Claim 21.

However, Hughes et al teach a structure in which the third layer comprises polyamide and grafted polymer, as discussed above, and Beuzelin et al teach that the compositions are employed for their resistance to separation of layers (page 15, lines 17 – 21). Therefore, one of ordinary skill in the art would have recognized the utility of varying the amounts of polyamide and grafted polymer to obtain a desired resistance to separation of layers. Therefore, the resistance to separation of the layers would be readily determined through routine optimization of the amounts of polyamide and grafted polymer in the mixture by one having ordinary skill in the art depending on the desired end use of the product.

It therefore would be obvious for one of ordinary skill in the art to vary the amount of polyamide and grafted polymer in the mixture in order to obtain a desired resistance to separation of the layers, since the desired resistance to separation would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end result as shown by Beuzelin et al and Hughes et al.

Appellant also argues that the requirements of Claim 44, which recites particular amounts of the third layer components, is even more remote from Beuzelin et al and Hughes et al than Claim 21.

However, as stated above, Hughes et al teach a structure in which the third layer comprises polyamide and grafted polymer, as discussed above, and Beuzelin et al teach that the compositions are employed for their resistance to separation of layers (page 15, lines 17 – 21).

Therefore, one of ordinary skill in the art would have recognized the utility of varying the amounts of polyamide and grafted polymer to obtain a desired resistance to separation of layers. Therefore, the resistance to separation of the layers would be readily determined through routine optimization of the amounts of polyamide and grafted polymer in the mixture by one having ordinary skill in the art depending on the desired end use of the product.

It therefore would be obvious for one of ordinary skill in the art to vary the amount of polyamide and grafted polymer in the mixture in order to obtain a desired resistance to separation of the layers, since the desired resistance to separation would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end result as shown by Beuzelin et al and Hughes et al.

Appellant also argues that Claim 45 is patentable for the same reasons as the reasons discussed with regard to Claim 21 and states that Hughes et al teach nothing regarding a PA 6/6-6 copolymer of caprolactam, adipic acid and hexamethylenediamine.

However, in response to the argument that Claim 45 is patentable for the same reasons as the reasons discussed with regard to Claim 21, the arguments with regard to Claim 21 are repeated; furthermore, Hughes et al teach the use of high – molecular weight polymers comprising polyamide 6,6 (column 15, lines 1 – 20) which is identical to polyamide 6-6, and therefore teach the use of copolymers comprising polyamide 6,6 with caprolactam.

Appellant also argues that Claim 46, which recites specific thicknesses of the first, second and third layers, provides a more convincing distinction from the prior art; Beuzelin et al discusses total thicknesses of its layer combinations, Appellant argues, but the neither the

polystyrene layer or binder layer of Beuzelin et al is one of Appellants first, second or third layers.

However, as stated above, the binder layer of Beuzelin et al and Hughes et al satisfies the limitations of the claimed third layer, and the first layer of Beuzelin et al comprises high density polyethylene as claimed (page 13, line 11 and lines 16 – 23). Furthermore, Beuzelin et al disclose a structure having a layer thickness of 100 to 1000 μm and a total thickness of 100 μm to 3 mm (page 14, lines 24 – 29) and teach the selection of thickness to obtain a desired adhesive strength (page 15, lines 17 – 20). Therefore, one of ordinary skill in the art would have recognized the utility of varying the thickness of the layer to obtain a desired adhesive strength. Therefore, the adhesive strength would be readily determined through routine optimization of thickness by one having ordinary skill in the art depending on the desired end use of the product.

It therefore would be obvious for one of ordinary skill in the art to vary the thickness in order to obtain a desired adhesive strength, since the adhesive strength would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end result as shown by Beuzelin et al.

Appellant also argues that Zhang et al does not teach or suggest modification of the Beuzelin et al or Hughes et al structure in any manner which makes up for the above – noted deficiencies of the references with regard to Claim 21.

However, as stated above, Beuzelin et al, as stated above, disclose the claimed invention except for the polyamide of the third layer, and the use of polyamide in the third layer would have been obvious to one of ordinary skill in the art in view of Hughes et al. Therefore, no deficiencies exist with regard to Claim 21 that would require making up by Zhang et al.

Appellant also argues that Melot does not teach or suggest modification of Beuzelin et al or Hughes et al in any manner which makes up for the above – noted deficiencies of these references with regard to Claim 21.

However, as stated above, Beuzelin et al, as stated above, disclose the claimed invention except for the polyamide of the third layer, and the use of polyamide in the third layer would have been obvious to one of ordinary skill in the art in view of Hughes et al. Therefore, no deficiencies exist with regard to Claim 21 that would require making up by Melot.

Appellant also argues that Melot does not teach a binder layer or have adhesive properties, thus one of ordinary skill in the art would not have been motivated to look to Melot to modify the binder composition of Beuzelin et al.

However, Melot is directed to the making of extrudable films comprising polyamide, (column 4, lines 59 – 67) and Beuzelin et al are directed to films comprising polyamide, as stated above which are extrudable (coextrusion binder; page 3, lines 9 – 11), thus one of ordinary skill in the art would have been motivated to look to Melot to modify the binder composition of Beuzelin et al.

Appellant also argues that Hata et al does not teach or suggest modification of Beuzelin et al or Hughes et al in any manner which makes up for the above – noted deficiencies of these references with regard to Claim 21.

However, as stated above, Beuzelin et al, as stated above, disclose the claimed invention except for the polyamide of the third layer, and the use of polyamide in the third layer would have been obvious to one of ordinary skill in the art in view of Hughes et al. Therefore, no deficiencies exist with regard to Claim 21 that would require making up by Hata et al.

Appellant also argues that one of ordinary skill in the art would not expect the layered materials of Beuzelin et al to be useful as fuel tank materials, because the materials are taught principally for use in making polystyrene cups and food containers; the Hata et al materials are used for fuel tank construction but they have a different structure from the Beuzelin et al materials which do not comprise polystyrene.

However, although Beuzelin et al state that the disclosed multilayer composite is commonly used for cups, Beuzelin et al do not limit the use of the composite to the making of cups. Furthermore, the Hata et al does comprise polystyrene, in a layer in which it is combined with high density polyethylene (column 4, lines 52 – 55 of Hata et al).

Appellant also argues that even if the Beuzelin et al binder modified by Hughes et al comprises a mixture of the claimed components, the definition of the binder at pages 3 – 5 of Beuzelin et al, contains many alternative permutations.

However, as stated above, although pages 3 – 5 of Beuzelin et al disclose equivalent embodiments for the composition of the binder, Beuzelin et al, as stated above, disclose the claimed invention except for the polyamide of the third layer, which would have been obvious to one of ordinary skill in the art in view of Hughes et al.

Appellant also argues that there is no suggestion in Beuzelin et al to co – graft two polymers from its list of '(c)' polymers on page 9.

However, as stated above, Beuzelin et al clearly disclose on page 4, lines 1 – 9, the co – grafting of a mixture of polystyrene and at least one ethylene – α olefin copolymer, and the ethylene – α olefin copolymers to be included in the mixture are in the list of '(c)' polymers on page 9 (page 9, lines 1 – 14).

Appellant also argues that Claim 49 recites 'consisting essentially of' language and, thus, excludes an additional layer such as the additional polystyrene layer of Beuzelin et al.

However, when an applicant claims that additional materials are excluded by the recitation 'consisting essentially of,' applicant has the burden of showing that the introduction of additional components would materially change the characteristics of applicant's invention. See MPEP 2111.03. As no such showing has been made by Appellant, the recitation 'consisting essentially of' has been treated as a recitation of 'comprising.' See MPEP 2111.03.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Marc Patterson

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